



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Jerome D. Brown et al. Examiner: John Quoc Nguyen  
Serial No.: 10/672,166 Group Art Unit: 3654  
Filed: September 26, 2003 Docket No.: 10387US01 (1201.180.101)  
Title: TAPE REEL ASSEMBLY WITH RADIALY SYMMETRIC DEFORMING  
TAPE WINDING SURFACE

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Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R § 1.131**

Dear Sir:

We, Jerome D. Brown (also known as Jerry D. Brown), Jerry L. Alexander, Dean E. Sitz, Peter A. Ridl, and Michael E. Reard, declare as follows:

1. We are the named inventors of the subject matter described and claimed in the above-identified U.S. Patent Application Serial No. 10/672,166 filed September 26, 2003.
2. We make this declaration in support of the patentability of the claims of U.S. Patent Application Serial No. 10/672,166.
3. This Declaration under 37 C.F.R. § 1.131 is made in response to the rejection of claims 1, 2, 5-9, 12-16, 19, and 20 under 35 U.S.C. § 102(a) over Zwettler et al., U.S. Patent No. 6,474,582 ("Zwettler"), and claims 3, 4, and 18 under 35 U.S.C. § 102(a), or in the alternative, under 35 U.S.C. § 103(a) over Zwettler. Zwettler was filed on March 26, 2001 and has a publication date of September 26, 2002.
4. Prior to the Zwettler publication date of September 26, 2002, we conceived the claimed subject matter of the above-identified invention. As factual evidence of our conception prior to the Zwettler publication date of September 26, 2002, attached hereto is Exhibit A.

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5. Exhibit A is a Confidential Imation Corp. Internal Correspondence document related to a pack stress analysis of a three piece tape reel assembly hub design and dated May 31, 2002. Exhibit A includes two pages. Page 1 of Exhibit A includes Figure 1, which illustrates an exploded view of a hub design, and Figure 2, which illustrates a cross-sectional view of a hub design. Page 2 of Exhibit A notes that the results of a computational stress analysis including a global sensitivity study run in Pro-Mechanica was employed to optimize radial deflection. In addition, Exhibit A at page 2 states that by offsetting a web 0.050 inches from a center line of a tape winding surface results in uniform radial deflection across a height of the winding surface.

6. Thus, not later than May 31, 2002, a computational stress analysis related to the subject matter of the pending application was evaluated indicating conception of the invention prior to the Zwettler publication date of September 26, 2002.

7. We were duly diligent from a date prior to September 26, 2002 to the date of filing of the pending application on September 26, 2003. As factual evidence of our diligence attached hereto is Exhibit B.

8. Exhibit B is a three page Confidential Imation Corp. Invention Record document witnessed on February 24, 2003. Note that Exhibit B includes an "embedded" document titled "9940\_3\_piece.doc," which is the same document as Exhibit A, above.

9. Exhibit A and Exhibit B are submitted as evidence of conception prior to the Zwettler publication date of September 26, 2002 coupled with continued diligence extending from a time prior to the Zwettler publication date of September 26, 2002 to the filing date of the pending application on September 26, 2003.

10. We respectfully submit that we possessed the claimed subject matter of U.S. Patent Application Serial No. 10/672,166 prior to September 26, 2002, and we were diligent

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from a time prior to the Zwettler publication date of September 26, 2002 to the filing date of the pending application on September 26, 2003. Thus, Zwettler should be removed as a prior art reference under 35 U.S.C. § 102(a).

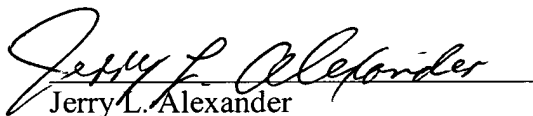
11. We declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or a patent issued thereon.



Jerome D. Brown, aka Jerry D. Brown

12/19/2005

Date

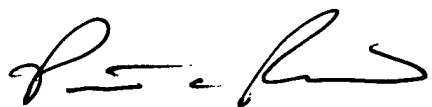
  
Jerry L. Alexander

12/24/2006

Date

Dean E. Sitz

Date



Peter A. Ridl

1/22/2006

Date

Michael E. Reard

Date

**Declaration under 37 C.F.R. § 1.132**

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from a time prior to the Zwettler publication date of September 26, 2002 to the filing date of the pending application on September 26, 2003. Thus, Zwettler should be removed as a prior art reference under 35 U.S.C. § 102(a).

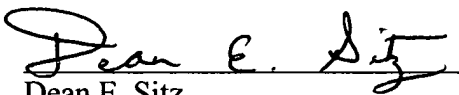
11. We declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or a patent issued thereon.

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Jerome D. Brown, aka Jerry D. Brown

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Date

\_\_\_\_\_  
Jerry L. Alexander

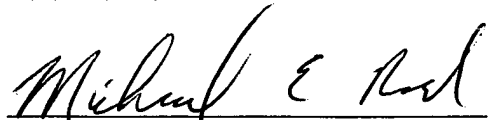
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Dean E. Sitz

\_\_\_\_\_  
Date 1/23/2006

\_\_\_\_\_  
Peter A. Ridl

\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Michael E. Reard

\_\_\_\_\_  
Date 1/23/2006

## EXHIBIT A

### INTERNAL CORRESPONDENCE

To: G.P. Rambosek, Chris Zwettler,  
Jerry Brown, Mike Reard, Jerry  
Alexander, Mike Martin

From: Pete Ridl

CC:

Date: May 31, 2002

Subject: 9940 Three Piece Hub design with Pack Stress Analysis



#### Design:

Due to the bottom tape edge damage that occurs in the current 9940 hubs (in hot-wet testing) a three piece single reel cartridge hub has been designed and analyzed. The configuration of the design is shown below in figure 1. (Refer to IIR 2000-0118, Reard et. al.)

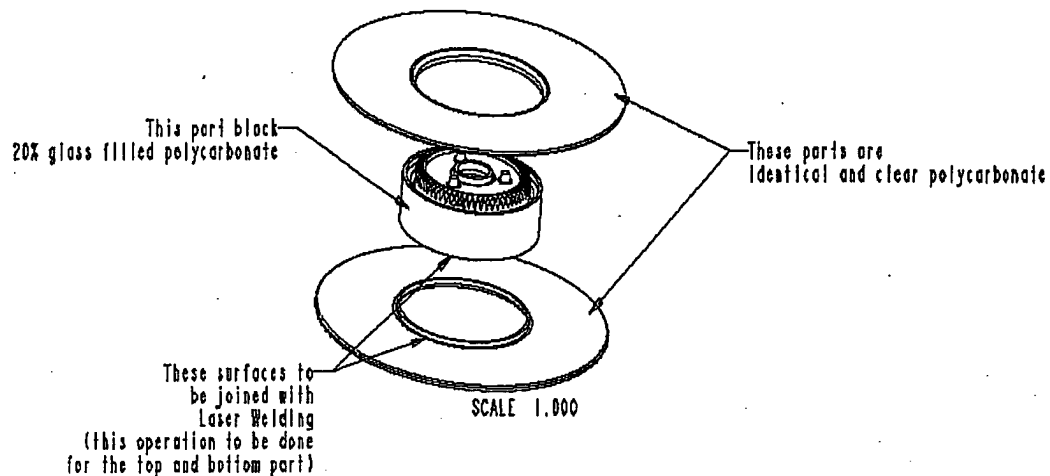


Figure 1.

A cross section of the final design is shown below in figure 2. The nominal wall thickness is 0.120".

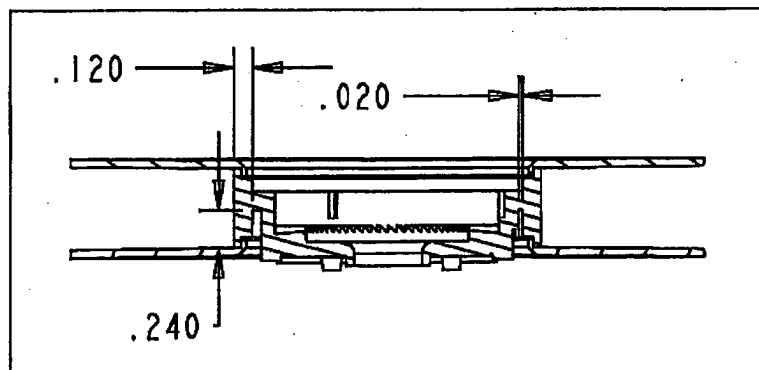


Figure 2

The hub design shown in Figure 2 was originally designed to have the reinforcing web aligned with the centerline of the winding surface. However, the centerline configuration didn't result in radially symmetric hub deflection so a global sensitivity study was run in Pro-Mechanica to optimize the radial deflection. The results showed that by offsetting the web .050" from the centerline of the winding surface the radial deflection would be fairly uniform across the height of the winding surface. Further hub displacement and stress results are discussed later.

### Analysis:

The tape pack analysis was performed with the OSU Hakiel's winding model, the Carnegie Mellon pack stress model (CMUPack), and Pro-Mechanica (a FEA package used in conjunction with Pro-Engineer). The characteristics for the hub and tape used in this analysis are as follows:

Hub Material:	20% Glass filled polycarbonate (E=720,000 psi)
Flange Material:	Clear Polycarbonate (E=340,000 psi)
Tape Tension:	4 oz. (1.112 N)
OD Tape Pack:	3.959in
Web Caliper:	0.00034in (8.636 micron)
Web Width:	0.498in (12.65mm)
Number of layers:	2932
Circumferential Modulus:	6655 Mpa (965226 psi)
Axial Modulus:	9000 Mpa
Shear Modulus:	25 Mpa
Poisson ratio:	0.3
Radial Modulus:	Attached in Appendix A

The core modulus/stiffness must be obtained in a different way for both the OSU Hakiel's winding model and the CMUPack analysis tool. For the OSU model an FEA analysis must be run with two different pressures applied to the winding surface (NOTE: All FEA models discussed in this report were constrained using axial symmetry). The strain corresponding to those pressures is obtained and plotted (Strain vs. Pressure). The core modulus is then obtained by taking 1/slope of the line created by those points. The core stiffness was obtained using Figure 3 below. The modulus was checked at the bottom, middle, and top of the winding surface.

# Invention Record



I.I.R. #  
2003-0019

Status: Recorded

Originating Imation Unit:  
Data Storage Components

Send Original to I.P. Scientist/Manager:  
Robert W. Frits/CS/Imation

Title:  
9940 three piece hub with laser welding and "flexing" flanges.

## Investigator Information:

Investigator  
Peter Ridi/DSP/Imation  
Tech. Ntbk. No.  
934  
Investigator

Imation Emp. Num.  
685526  
Div. / Lab Name  
DS&IM  
Imation Emp. Num.

Tech. Ntbk. No.

Div. / Lab Name

Described By: Ridi, Peter

*This document has been read and understood by me.*

Witness: Jason E. Moses/DSP/Imation  
Date: 02/24/2003

Date: 02/24/2003

**Other potentially interested imation Units:**

Was Patent / Literature No  
search completed? by Whom?

Who has search results?

Person from whom samples, etc can be obtained:

Pete Ridl, Mike Martin, Dean Sitz

Invention relates to gov-funded research?

No

Invention relates to an outside agreement?

No

**Include all of the following:**

**1. Short description of the invention:**

This invention is a three piece data storage tape hub assembly. This hub has two flanges that are identical. The drive teeth are attached to the hub not to the flange like other three piece designs that exist in the marketplace.

**2. Describe the utility of the invention and describe the advantages of this invention over the current art.**

This invention provides uniform collapse of the hub which creates uniform support of the tape pack. Current 9940 hubs provide more support to the tape pack at the lower flange than at the upper flange. This design also calls for laser welding which is a fairly new and improved way of welding thermoplastic materials. Due to the attachment of the flanges and the uniform collapse of the hub the flanges flex inward toward the tape which could reduce the amount of pop strands in the cartridge. All the details are discussed in the report attached below.

**3. Provide one or more detailed examples which illustrate the invention. Incorporate any needed sketches or informal drawing in the text of the I.I.R.**



9940\_3\_piece.doc

**4. Provide a list of any other related information such as publications, internal reports, memoranda, I.I.R.'s etc.**  
IIR 2000-0118, IIR 2001-0072

**5. Identify any other people who were consulted or otherwise involved in this invention.**

Phil Rambosek, Chris Zwettler, Jerry Alexander

**6. Other**

None



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Submitted By --> Peter Ridi  
Submitted on --> 2/20/2003 6:29:09 PM  
Pending By --> Robert W. Frits  
Pending on --> 02/24/2003 8:47:17 AM  
Approved By --> Robert W. Frits

Approved on -->

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